Customer No. 27061 Patent
Confirmation No. 5758 Attorney Docket No. GEMS8081.237

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	Ertel, Jason R.
Serial No.	:	10/711,759
Filed	:	October 4, 2004
For	:	RADIOGRAPHIC DETECTOR DOCKING STATION WITH DYNAMIC ENVIRONMENTAL CONTROL
Group Art No.	:	3744
Examiner	:	Melvin Jones

CERTIFICATION UNDER 37 CFR 1.8(a) and 1.10

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37 CFR 1.8(a) **37 CFR 1.10**

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Date: November 4, 2008 /Robyn L. Templin/
Signature

Commissioner for Patents
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Alexandria, VA 22313-1450

APPEAL BRIEF PURSUANT TO 37 C.F.R. §41.37

Dear Sir:

This Appeal Brief is being filed in furtherance of the Notice of Appeal filed on September 4, 2008.

1. **REAL PARTY IN INTEREST:**

The real party in interest is General Electric Company, the Assignee of the above-referenced application by virtue of the Assignment to General Electric Company, recorded on October 4, 2004, at reel 015214, frame 0968.

2. **RELATED APPEALS AND INTERFERENCES:**

Appellant is unaware of any other appeals or interferences related to this Appeal. The undersigned is Appellant's legal representative in this Appeal. General Electric Company, the Assignee of the above-referenced Application, as evidenced by the documents mentioned above, will be directly affected by the Board's decision in the pending appeal.

3. **STATUS OF THE CLAIMS:**

Claims 1-26 are currently pending, and claim 1 is currently under final rejection and, thus, is the subject of this appeal. Claims 2-15 were objected to by the Examiner as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 16-26 are allowed.

4. **STATUS OF AMENDMENTS:**

All previous amendments have been entered. Appellant has not submitted any amendments subsequent to the Final Office Action of June 4, 2008.

5. **SUMMARY OF THE CLAIMED SUBJECT MATTER:**

Claim 1 calls for an x-ray detector storage device (84). *Published Application*, ¶64; Fig. 14. The x-ray detector storage device (84) comprises a storage bin (122) sized to store at least one x-ray detector (30). *Id*. The x-ray detector storage device (84) also includes a temperature regulator (116) configured to adjust a temperature of a stored x-ray detector (30) to a desired temperature. *Id*. at ¶64-65.

6. **GROUNDS OF REJECTION:**

In the Final Office Action mailed June 4, 2008, the Examiner rejected claim 1 under 35 U.S.C. §102(b) as being anticipated by JP 2002006049 (Canon Inc.).

7. **ARGUMENT:**

Rejection Under 35 U.S.C. §102(b) Over JP 2002006049 (Canon Inc.)

Claim 1

The Examiner rejected claim 1 under §102(b) as being anticipated by a figure of JP 2002006049 (Canon Inc.) (hereinafter "JP '049"). Appellant notes that claim 1 was originally indicated as being allowable over the prior art of record in an Ex Parte Quayle Office Action mailed August 22, 2007. However, without explanation, and using a reference previously made of-record, the Examiner withdrew the indication of allowability and rejected claim 1 in view of JP '049, only citing to "see figure" in the reference. Specifically, the Examiner stated that "[t]he Japanese Patent Application (Canon Inc.) discloses an portable (sic) X-Ray Imaging Device comprising: an x-ray imaging device is enclosed within a housing structure, an electronic circuit for monitoring conditions and processing electric signal and regulating cooling unit temperature by operating the blower and supplying air current into the enclosure (see figure)." *Final Office Action*, June 4, 2008, p. 2. Appellant respectfully disagrees with the rejection. Specifically, seeing that the Examiner did not provide a translation, and does not rely on any translated text, but merely the figure of the reference, Appellant believes that the Examiner has over-characterized the teachings relied upon in JP '049 and has failed to give patentable weight to each of the elements called for in claim 1.

Claim 1 calls for, in part, "a temperature regulator configured to adjust a temperature of a stored x-ray detector to a desired temperature." *See Claim 1.* Relying solely upon the figure of JP '049, the Examiner alleged that JP '049 teaches "an electronic circuit for monitoring conditions and processing electric signal and regulating cooling unit temperature…" *Final Office Action*, supra. However, even considering the English abstract of the reference, the alleged electronic circuit of JP '049 clearly does not act as a temperature regulator, as is called for in claim 1. In fact, the abstract and drawings of JP '049 merely teach that "[t]he imaging device is composed of an electronic circuit component which processes the electric signal of the conversion element." *JP '049*, Abstract. As such, the electronic circuit of the reference cannot be shown to act as "a temperature regulator," but is instead used to process electric signals of the conversion element. The Examiner's conclusion, therefore, is in no way supported by either the figure or the text of the abstract of JP '049. According to MPEP 2131, "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *See MPEP 2131,* (emphasis added).

In response to Appellant's explanation of JP '049 in its reply filed February 29, 2008, the Examiner attempted to justify the rejection of claim 1, stating: "[s]ince it is blower (sic) inherently cycle on and off basic (sic) on set temperature conditions it is therefore deem (sic) to consist of a temperature regulating feature." *Final Office Action*, supra. While the Examiner's argument is difficult to comprehend, it appears that the Examiner contends that JP '049 inherently consists of a temperature regulator due to the presence of a cooling unit attached to an x-ray digital imaging device. While the abstract of JP '049 does show a cooling unit, there is absolutely no indication that the x-ray imaging device comprises a temperature regulator capable of adjusting a temperature of an x-ray detector to a desired temperature, as is claimed. The JP '049 abstract does not describe any "desired temperature" or means for regulating such a temperature. The Examiner's statement that there would be "set temperature conditions" is completely unfounded and has not shown that such is inherent in cooling unit systems generally, and the Examiner has certainly not set forth any facts or reasoning why such would be inherent in an x-ray detector storage device wherein a temperature regulator is configured to adjust the temperature of a stored x-ray detector in a storage bin to a desired temperature. Conversely, JP '049 simply discloses a cooling unit 21A that appears to blow air across an x-ray digital imaging device. Not only is there no temperature regulation disclosed, there is certainly no disclosure of temperature regulation of an x-ray storage bin. Such a storage device is not to be confused with the imaging device disclosed in JP '049. As such, Appellant believes that the Examiner's rejection of claim 1 under §102(b) cannot be sustained, as JP '049 cannot be shown to teach or suggest each and every limitation of the claim.

For clarification, referring to the drawings of the current application, Fig. 1 is a mobile/portable x-ray imaging system 10 similar to that shown in JP '049 as referenced with numeral 4 in the figures, but that is where the similarities end. The present application shows exemplary x-ray detectors in Figs. 3-6. Distinctly, Appellant shows its storage device in Figs. 7-13. While Appellant does not intend to read limitations in the specification into the claims, the claims must be read in light of the specification. *See MPEP 2111*. Here, claim 1 calls for an x-ray detector storage device comprising a storage bin sized to store at least one x-ray detector. JP '049 discloses no such storage device having a storage bin such as that called for in claim 1 by Appellant. JP '049 merely discloses an overall x-ray device that is similar to Appellant's Fig. 1, but JP '049 does not show any x-ray detector "storage device" or "storage bin" as specifically called for in claim 1. Claim 1 also calls for a temperature regulator to adjust the temperature of the stored x-ray detectors in the storage bin to a desired temperature. As previously set forth, this

element is wholly absent from JP '049. That is, JP '049 merely shows a cooling unit 21A to blow air into and through a portable x-ray imaging device of a type similar to that shown in Fig. 1 of the present application. Accordingly, as JP '049 does not expressly or inherently teach each and every limitation of claim 1, Appellant believes that the claim cannot be anticipated by JP '049 under §102(b).

Additionally, by relying upon only the figure and perhaps the English abstract in formulating the rejection to claim 1, the Examiner failed to provide specific reference as to which elements of JP '049 were relied upon to teach the limitations of claim 1. According to the MPEP, "[c]itation and reliance upon an abstract without citation of and reliance upon the underlying scientific document is generally inappropriate." *See MPEP 706.02(II)*. Further, "[t]he record must also be clear as to whether the examiner is relying upon the abstract or the full text document to support a rejection." *Id.* As the Examiner only submitted the English language abstract of JP '049, as opposed to a translation of the underlying foreign patent document, Appellant is left to assume that only the figure cited, and perhaps the abstract, were relied upon by the Examiner. Such reliance is inappropriate, particularly when the abstract clearly does not teach each and every limitation of the claim, as is required to reject a claim under 35 U.S.C. §102(b).

Nevertheless, in the interest of advancing the application and minimizing the Board's time, Appellant is submitting herewith a machine translation of JP '049 (see Evidence Appendix herein). The machine translation of JP '049 is not new evidence because (1) it is a reference cited by the Examiner, (2) the Examiner has relied on the reference as the primary reference for a final rejection and previously submitted an English abstract of JP '049, and the machine-translated document attached as the Appendix is readily available at the JPO website (www.jpo.go.jp). While not perfect, the translation provides enough detail to enable the Appellant to confidently assert that JP '049 does not anticipate the x-ray detector storage device called for in claim 1. Specifically, JP '049 merely teaches a refrigeration unit 21 and fan 21a configured to blow cold air to a case 4 containing an optoelectric transducer 1. *See JP '049 translation*, Para. [0006], [0016], Fig. 1. Nowhere does JP '049 disclose "a temperature regulator configured to adjust a temperature of a stored x-ray detector to a desired temperature," as is called for in claim 1.

Accordingly, in light of all the above, Appellant believes that claim 1 is patentably distinct over the JP '049 reference. Appellant therefore respectfully requests withdrawal of the present rejection.

8. **CONCLUSION**

In view of the above remarks, Appellant respectfully submits that the Examiner has provided no sustainable rejections or evidence that claim 1 is not patentable. As argued above, the Examiner has mischaracterized the teachings of JP '049 to reject the present claim and has provided no reasonable explanation as to how the elements of JP '049 teach each and every limitation of claim 1. Accordingly, Appellant believes claim 1 is patentably distinct over the cited references and respectfully requests that the Board find claim 1 patentable over the prior art of record, direct withdrawal of all outstanding rejections, and direct the present application be passed to issuance.

Respectfully submitted,

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Dated: November 4, 2008
Attorney Docket No.: GEMS8081.237

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CLAIMS APPENDIX

In the Claims

1. (Original) An x-ray detector storage device comprising:

a storage bin sized to store at least one x-ray detector; and

a temperature regulator configured to adjust a temperature of a stored x-ray detector to a desired temperature.

2. (Previously Presented) The x-ray detector storage device of claim 1 wherein the storage bin is configured to store an x-ray detector that is detached from an x-ray scanner.

3. (Original) The x-ray detector storage device of claim 1 wherein the storage bin is remote from an x-ray scanner.

4. (Original) The x-ray detector storage device of claim 1 wherein the storage bin includes a data port to interface with a stored x-ray detector and route temperature data of the stored x-ray detector to the temperature regulator.

5. (Original) The x-ray detector storage device of claim 1 wherein the temperature regulator is configured to effectuate an increase or a decrease in the temperature of the stored x-ray detector to adjust the temperature of the x-ray detector to the desired temperature.

6. (Original) The x-ray detector storage device of claim 1 wherein the temperature regulator includes a controller configured to compare the temperature of the stored x-ray detector to the desired temperature and, from the comparison, determine a rate of temperature adjustment needed to bring the temperature of the stored x-ray detector to the desired temperature without placing thermal stress on internal components of the stored x-ray detector.

7. (Original) The x-ray detector storage device of claim 1 wherein the temperature regulator includes a thermo-electric cooling device to adjust the temperature of the stored x-ray detector.

8. (Original) The x-ray detector storage device of claim 7 wherein the thermo-electric cooling device is a Peltier device.

9. (Original) The x-ray detector storage device of claim 1 wherein the temperature regulator includes a compressor for passing compressed air about one or more outer surfaces of the stored x-ray detector.

10. (Original) The x-ray detector storage device of claim 1 wherein the temperature regulator includes a closed coolant circuit and a coolant source designed to circulate coolant about the stored x-ray detector.

11. (Original) The x-ray detector storage device of claim 1 wherein the temperature regulator includes one or more fans.

12. (Original) The x-ray detector storage device of claim 11 wherein the one or more fans is variable speed controllable.

13. (Original) The x-ray detector storage device of claim 1 wherein the temperature regulator includes a heat sink constructed to engage a heated surface of the stored x-ray detector.

14. (Original) The x-ray detector storage device of claim 1 wherein the storage bin is configured to store multiple x-ray detectors and wherein the temperature regulator is configured to independently adjust a temperature of the multiple x-ray detectors.

15. (Original) The x-ray detector storage device of claim 1 further comprising an LED constructed to provide a visual indication that a stored x-ray detector has a temperature substantially equivalent to the desired temperature.

16. (Original) An x-ray detector storage apparatus comprising:

a receptacle sized to receive an x-ray detector during non-use of the x-ray detector;

a temperature control interface connected to the receptacle and configured to provide feedback as to a temperature of an x-ray detector when the x-ray detector is disposed within the receptacle;

a thermal exchange system configured to regulate the temperature of an x-ray detector when the x-ray detector is disposed within the receptacle; and

a controller operationally connected to receive the feedback and control the thermal exchange system to reduce a difference between the temperature of an x-ray detector disposed in the receptacle and a desired temperature.

17. (Original) The apparatus of claim 16 wherein the thermal exchange system is configured to regulate thermal exchange with an x-ray detector using at least one of convection, conduction, and radiation.

18. (Original) The apparatus of claim 17 wherein the thermal exchange system includes one of a forced air exchange, a cold plate, a heat sink, and a thermo-electric cooling device.

19. (Original) The apparatus of claim 16 wherein the controller is further configured to control the thermal exchange system to transfer heat to the x-ray detector if the temperature of the x-ray detector is less than a desired temperature for data acquisition and remove heat from the x-ray detector if the temperature of the x-ray detector exceeds a desired temperature for data acquisition.

20. (Original) The apparatus of claim 16 configured to be remote from an x-ray scanner.

21. (Original) The apparatus of claim 16 further comprising a proximity sensor electronically connected to the controller and configured to provide feedback to the controller as to whether an x-ray detector is disposed in the receptacle.

22. (Original) The apparatus of claim 21 wherein the controller is further configured to repeatedly acquire temperature data from an x-ray detector deemed present in the receptacle.

23. (Original) The apparatus of claim 16 wherein the receptacle is further configured to receive a plurality of x-ray detectors.

24. (Original) The apparatus of claim 16 wherein the receptacle is sized to receive a flat panel, solid state x-ray detector.

25. (Original) An x-ray detector docking station comprising:

a storage bin sized to receive one or more flat panel x-ray detectors;

an interface configured to receive temperature data from a flat panel x-ray detector disposed in the storage bin; and

means for regulating a temperature of the flat panel x-ray detector based on temperature data received from the interface.

26. (Original) The x-ray detector docking station of claim 25 further comprising means for charging a battery of a stored flat panel x-ray detector.

EVIDENCE APPENDIX:

Exhibit A: JP2002006049 (Machine Translation)

RELATED PROCEEDINGS APPENDIX:

-- None --

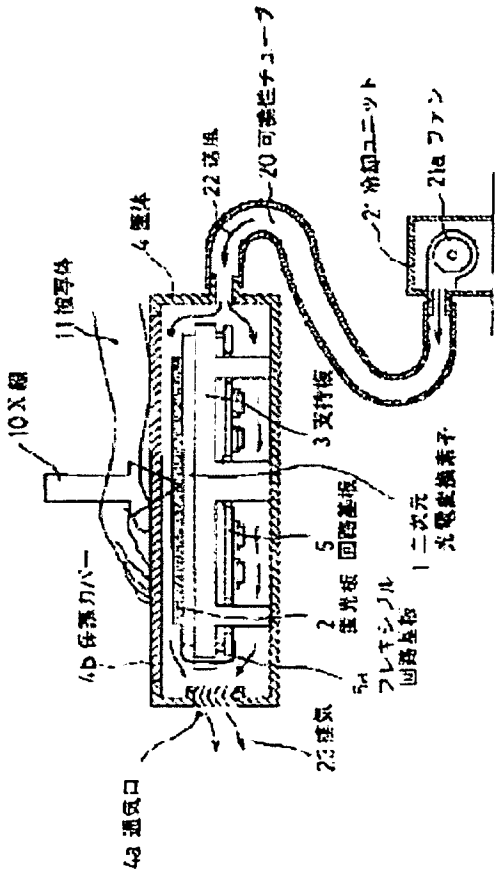
X-RAY DIGITAL IMAGING DEVICE

Patent number: JP2002006049
Publication date: 2002-01-09
Inventor: HATA FUMIO
Applicant: CANON INC
Classification:
- international: G01T1/20; G01T1/29; G01T7/00
- european:
Application number: JP20000191526 20000626
Priority number(s):

Also published as:
JP2002006049 (A)

Abstract of **JP2002006049**

PROBLEM TO BE SOLVED: To make a cassette single body small and lightweight by a method wherein a stationary-type cooling unit is installed separately from a portable- type cassette and both are connected by a flexible tube.
SOLUTION: The X-ray digital imaging device of a portable type is composed of a photoelectric conversion element in which a phosphor emits light by irradiation with X-rays so as to be converted into an electric signal as a pixel (sensor) sensitive to its visible light. The imaging device is composed of an electronic circuit component which processes the electric signal of the conversion element. The imaging device is composed of a support structure which supports them. The imaging device is composed of an enclosure which houses them. The imaging device records an image as a digital signal. The enclosure and the cooling unit which is installed separately from it are connected by the flexible tube. An air current which is generated by a blower inside the cooling unit is introduced into the enclosure so as to cool the conversion element and the circuit component.



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* NOTICES *

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3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to the X-ray digital imaging device which used the portability type digital type cassette for roentgenography.
[0002]
[Description of the Prior Art]After sticking a silver halide film and an intensifying screen, storing to a cassette for many years and irradiating with X-rays, the method of developing said film has been performed in roentgenography. In recent years, electronization of roentgenography is quickly performed with the two-dimensional optoelectric transducer of a large area, and progress of digital-image-processing art.
[0003]Such electronization compares saving of consumable goods, such as facilitating of quick-izing of a photographing-results display, and picture transmission, facilitating of image data preservation and search, and a film, etc. with the conventional filming method, It has many predominance (see an electronic cassette for X-ray image record, an X ray radiogram photographing method, etc. of JP,6-342099,A).
[0004]On the other hand, the optoelectric transducer formed by the two-dimensional array mainly on the glass plate, the electronic circuit for the signal processing, etc. are required for photoelectric conversion, and there was a disadvantageous field in the miniaturization of a device, and a weight saving. This point is hereafter explained with reference to drawing 4.
[0005]Drawing 4 is a sectional view showing the example of the portability type digital cassette in the former. The cases 4 are opaque metal and a product made from a plastic, and have become the protective panel 4b (case lid) which consists of the part or members (for example, CFRP= carbon fiber reinforced plastics etc.) radiolucent in all.
[0006]Inside the case 4, from the side near the protective panel 4b. The flexible circuit board 5a for taking out the electrical signal of the optoelectric transducer 1 of the fluorescent screen

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2 which provided the fluorescent substance for changing X-rays into fluorescence (visible light), and the two-dimensional array which changes fluorescence (visible light) into an electrical signal, the support plate 3 which fixes these, and the optoelectric transducer 1, The electronic circuit board 5 etc. in which an electronic circuit, a power supply section, etc. which process an electrical signal are carried are stored.

[0007]And the photographic subject 11 which carries out roentgenography is placed on the protective cover 4b, after an appropriate time is irradiated with X-rays 10, and the picture (digital image) by roentgenography can be simultaneously acquired by supplying and driving power to the optoelectric transducer 1, the electronic circuit board 5, etc.

[0008]Inside the case 4, in order to repeat such operation, whenever an electronic circuit board etc. are roentgenography, they consume electric power and, as a result, generate heat. Since it is necessary to always energize during the period of use in order for some [, such as a power supply section,] circuits to keep the time required of roentgenography brief, and it is necessary to consider it as a waiting state, the temperature of the period and case 4 inside rises gradually.

[0009]Generally, since the electronic parts on the optoelectric transducer 1, the circuit board 5, and 5a comprise semiconductors, such as amorphous silicon and crystalline silicon, the rise of ambient air temperature brings about adverse effects, such as degradation of X-rays equipment, change, etc., such as change of the image deterioration by the increase in thermal noise, and the rate of signal amplification.

[0010]The internal rise in heat of the case 4 also heats the protective panel 4b, and the temperature of the field which the photographic subject 11 touches also rises. Install and in the X-rays equipment of the conventional medical application of a mold. Japanese Industrial Standard JIS T1001(safe general notices of medical electrical equipment)11.1 (2) -- skin temperature -- 41 ** -- it must not exceed (safety allowable temperature which a human body touches), since it is carried out, The ventilating fan 6 was formed in the case 4, and suppressing a rise in heat has been performed by exhausting internal air compulsorily.

[0011]

[Problem(s) to be Solved by the Invention]However, when adopting the above-mentioned conventional example as a portable type as it is, there were the following problems.

1. Since the ventilating fan 6 is built in, the case 4 becomes large and the weight of the whole device increases. Therefore, the portability of a device is spoiled.

2. It is necessary to form the vent 4a in a case. It is necessary for this vent to constitute complicated ventilating routes, in order to protect the optoelectric transducer 1 inside a case, the circuit boards 5 and 5a, etc. from fluid invasion of a foreign matter, a light leak, a disinfectant, etc., and becomes a factor which a size, weight, and cost increase. For this complicated course, since resistance of the aeration style 22 and exhaust air 23 increases

EXHIBIT A

remarkably, the displacement of the ventilating fan 6 must also be increased and this will bring about a size and the increase of weight further.

[0012]The places by which this invention was made in order to cancel such a problem, and it is characterized [the] are small size and carrying out a weight saving about a cassette simple substance by providing a fixed type refrigeration unit in portability type a cassette and a different body, and connecting both to them by a flexible tube.

[0013]

[Means for Solving the Problem]For this reason, an optoelectric transducer which changes a fluorescent substance into an electrical signal by the exposure of X-rays in this invention as a pixel (sensor) which emits light and induces that visible light, In a portability type X-ray digital imaging device which consists of an electronic circuit part article which processes electric generating power of this optoelectric transducer, a supporting structure body which supports these, and a case which stores these, and records a picture as a digital signal, Said case and this introduce into said case an air current which connected by a flexible tube and generated a refrigeration unit provided independently with a fan in said refrigeration unit, and cool said optoelectric transducer and an electronic circuit part article.

[0014]In this case, as an embodiment of the invention, form a heat exchange mechanism in said refrigeration unit, and by work of this heat exchange mind. A thing of ventilating routes of inhalation of air of sending cold below a room temperature in said case, said refrigeration unit, and said case, and exhaust air on the other hand or both established for a dustproof filter inside, Said flexible tube is provided with two lines, a ** style to said case, and flowing back, about said refrigeration unit, and, as for said case, it is effective respectively except an end connection with said tube to consider it as an airtight structure etc.

[0015]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is concretely described with reference to drawing 1 thru/or drawing 3. The outline section where 2nd and 3rd embodiments are typical has shown a 1st embodiment to drawing 2 and drawing 3 again at drawing 1, respectively.

[0016](A 1st embodiment) In the embodiment of the invention shown in drawing 1, independently [the portability type case 4], the fixed type refrigeration unit 21 is prepared and the fan 21a for the air blasting 22 is formed in the inside. And from the refrigeration unit 21, after passing along the flexible tube 20, introducing cold blast in the case 4 and cooling an inside, it is discharged out of the case 4 through the vent 4a.

[0017]Since the inside of the case 4 is kept higher than atmospheric pressure during use, there is little awe of the foreign matter invasion from the vent 4a, and invasion of a fluid droplet etc. is also prevented. Therefore, the structure of the vent 4a should take into consideration only the protection from light which influences photography. Invasion of dust can also be prevented

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by providing a dustproof filter (not shown) in the inlet port of the fan 21a, etc. Other composition is the same as usual.

[0018]a deer being carried out, and it connecting with the case 4, and the refrigeration unit 21 being placed, and via the flexible tube 20, when using it, The photographic subject 11 which carries out roentgenography is placed on the protective cover 4b, it irradiates with X-rays 10, and the picture (digital image) by roentgenography can be simultaneously acquired by supplying and driving power to the optoelectric transducer 1, the electronic circuit board 5, etc.

[0019]Inside the case 4, in order to repeat such operation, whenever an electronic circuit board etc. are roentgenography, they consume electric power and, as a result, generate heat. Since it is necessary to always energize during the period of use in order for some [, such as a power supply section,] circuits to keep the time required of roentgenography brief, and it is necessary to consider it as a waiting state, heat dissipation continues in the period and case 4 inside. However, heat can be emitted outside by work of the above-mentioned refrigeration unit 21.

[0020]And since a cooling method is not equipped, the small size and a weight saving can fully be performed to case 4 the very thing.

[0021](A 2nd embodiment) A 2nd embodiment concerning this invention is shown to drawing 2 by the section. Here, the flexible tube 20a is provided with the channel of two round trips of a ** style and flowing back, and circulates through the air blasting 22 and exhaust air 23 within the case 4 and the refrigeration unit 21. For this reason, the heat exchange mechanism 21b is formed in the inside of the refrigeration unit 21, and it has become it with the structure which absorbs the heat from exhaust air 23.

[0022]Thereby, it is not necessary to provide the vent for exhaust air, etc. in case 4 the very thing, and, unlike a 1st embodiment, can be considered as more perfect airtight structure at it. Therefore, it is also possible to use as inactive gas other than air or the fluid of electric insulation the cooling medium enclosed in the case 4 if needed.

[0023](A 3rd embodiment) With medical-application X-rays equipment, covering the portion which touches a human body, i.e., a photographing instrument, (case 4) with raintight covers, such as vinyl, in order to prevent infection by bacteria etc. is usually performed.

[0024]According to a 3rd embodiment concerning this invention, as shown in drawing 3, with the composition in a 2nd embodiment, and it is possible to wrap some flexible tubes 20a in the raintight cover 24, and a safer device can be provided for reasons of sanitation. [the case 4]

[0025]

[Effect of the Invention]As explained above, according to this invention, since it is the structure which separated the refrigeration unit from the case, a small and lightweight portability type X-ray digital imaging device is easily realizable.

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[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]It is a sectional view showing a 1st embodiment concerning this invention.
[Drawing 2]Similarly, it is a sectional view showing a 2nd embodiment.
[Drawing 3]Similarly, it is a sectional view showing a 3rd embodiment.
[Drawing 4]It is a sectional view of the conventional X ray digital cassette.
[Description of Notations]
1 Two-dimensional optoelectric transducer
2 Fluorescent screen
3 Support plate
4 Case
4a Vent
4b Protective cover
5 Circuit board
5a Flexible circuit board
6 Ventilating fan
10 X-rays
11 Photographic subject
20 and 20a flexible tube
21 Refrigeration unit
21a Fan
21b Heat exchange mechanism

[Translation done.]

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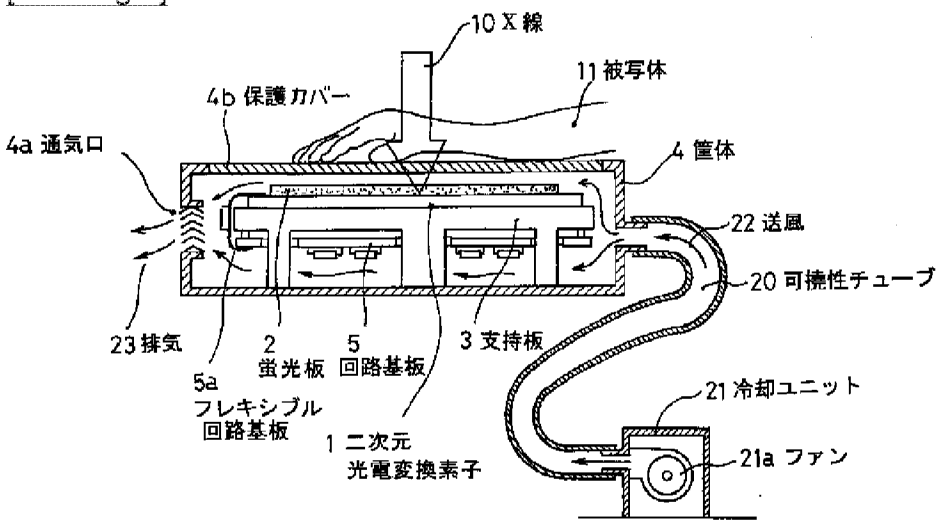
DRAWINGS

[Drawing 1]



[Drawing 2]

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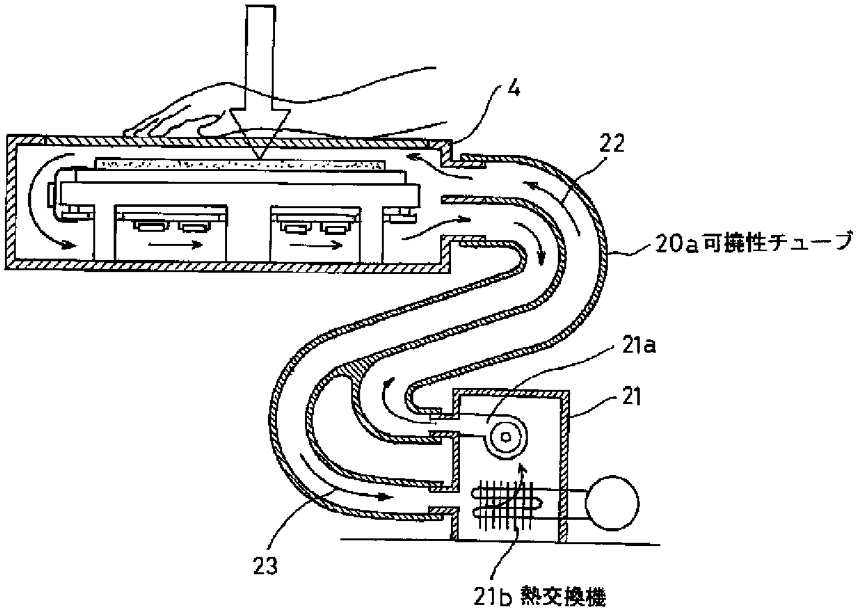
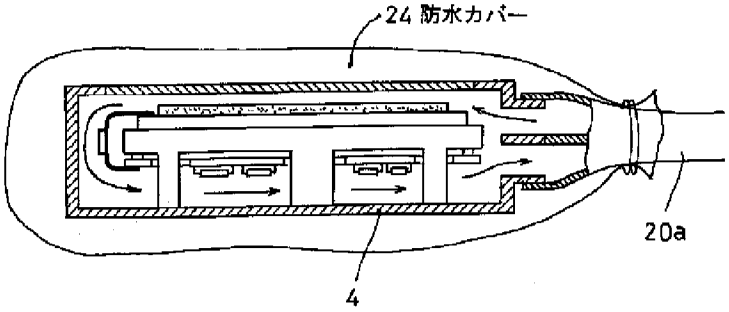
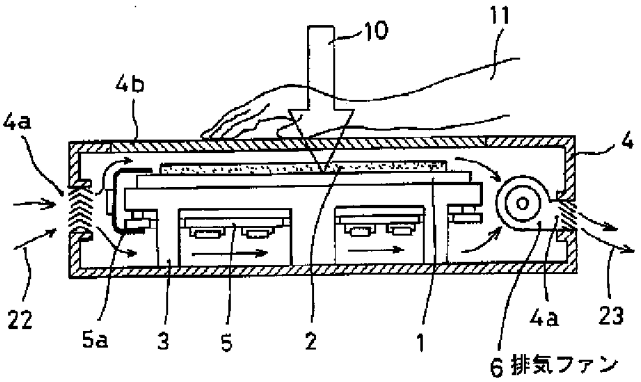


[Drawing 3]



[Drawing 4]



[Translation done.]